



WEST BENGAL STATE UNIVERSITY
B.A./B.Sc. Honours 1st Semester Examination, 2020, held in 2021

CMAACOR02T-COMPUTER APPLICATION (CC2)

COMPUTER FUNDAMENTALS

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

Answer Question Number 1 and any four from the rest

1. Answer any **five** questions from the following: 2×5 = 10
- (a) Distinguish between System Software and Application Software.
 - (b) Using 2's complement method find the value of $(15)_{10} - (27)_{10}$.
 - (c) State the advantage of 2's complement representation over 1's complement representation.
 - (d) Distinguish between Combinational and Sequential Circuit.
 - (e) Distinguish between Sequential and Random Access memory.
 - (f) Why is primary memory faster than the secondary memory?
 - (g) What is the difference between Address Bus and Data Bus?
 - (h) What is the use of the device driver?
2. (a) What are the essential components of a digital computer? Draw the schematic (2+2+4)+2 block diagram of a digital computer showing its essential components. Discuss the function of each component.
- (b) What do you mean by a System Software? Give an example.
3. (a) In a certain number systems X and Y are two successive digits. When written as 4+(3+3) XY, the decimal equivalent is 25 and when written as YX, the decimal equivalent is 31. Find X and Y and the base of the system.
- (b) Convert $(2148.87)_{10}$ into the following two bases:
- (i) Octal
 - (ii) Binary
4. (a) What do you mean by min-term and max-term of a Boolean expression? (2+6)+2 Minimize the Boolean function
- $$F(A, B, C, D) = \sum m(0, 2, 3, 6, 7, 12, 13, 14) + \sum d(1, 4, 11, 15).$$
- (b) Show that the dual of XOR is equal to its complement.

5. (a) Implement XOR gate with NAND gate. 4+4+2
(b) Explain Full Adder with Truth Table.
(c) What is a priority encoder?
6. (a) What do you mean by a Race Condition? How will you remove it by Master-Slave JK Flip-flop? (1+2)+3+4
(b) Design a Flip-Flop using NAND Gate.
(c) Design a 4-bit Ripple Counter.
7. (a) What is the purpose of ports, buses and controllers in the I/O system? 2+(2+2)+(2+2)
(b) What is the function of a Cache Memory? What is the purpose of OCR software in optical character recognition?
(c) What is the purpose of providing registers in a CPU? Explain the role of Timing and Control unit of a CPU.
8. Write short notes on any *two* of the following: 5+5
(a) Cloud Computing
(b) Data Mining
(c) Embedded Systems
(d) e-Library.

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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